

**REMARKS**

Applicants respectfully request further examination and reconsideration in view of the above amendments and the comments set forth fully below. Claims 27-30, 35-38, 40, 42, 44-48 and 50-61 were pending. Within the Office Action, Claims 27-30, 35-38, 40, 42, 44-48 and 50-61 have been rejected. By the above amendments, Claim 27 has been amended. Accordingly, Claims 27-30, 35-38, 40, 42, 44-48 and 50-61 are now pending.

**Rejections Under 35 U.S.C. § 102**

Within the Office Action, Claims 27 and 28 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,368,823 to McGraw et al. (hereinafter “McGraw”). The applicants respectfully disagree.

McGraw is directed to an apparatus and method for the automated synthesis of DNA segments utilizing multiple reaction columns. [McGraw, Abstract] Specifically, the columns of McGraw are all open at the inlet end to the atmosphere of a reaction chamber. [McGraw, Abstract] However, McGraw does not teach a body comprising an interior wall wherein the interior wall linearly tapers from the exterior support to the frit. Further, McGraw does not teach a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening. Instead, McGraw teaches “a cylindrically shaped” reaction column 11 whose interior and outer walls only taper once below its “frit”, not continuously from the top opening to the bottom opening or from the exterior support to the frit. [McGraw, Fig. 6 and col. 5, lines 49-50] Accordingly, McGraw does not teach the presently claimed invention.

The independent Claim 27 is directed to a vial comprising an exterior support and a bored interior having a consistent dimension to hold a frit for retaining material within the vial ***directly*** above the frit and maintain a consistent flow through the bored interior during a flushing procedure by ***only*** forming a pressure differential to expel material from the vial and a solid support retained within the vial above the frit after the flushing procedure, wherein the bored interior linearly tapers from the exterior support to the frit. As discussed above, McGraw does not teach wherein the interior wall linearly tapers from the exterior support to the frit. For at least these reasons, the independent Claim 27 is allowable over the teachings of McGraw.

Claim 28 is dependent on the independent Claim 27 and adds a further limitation specifying that the vial comprises an exterior dimension to fit ***directly*** within a receiving hole of a cartridge, thereby providing a pressure-tight seal ***directly*** between the vial and the cartridge. As

discussed above, McGraw does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. In contrast, McGraw teaches that the column 11 is inserted into the Luer fitting 15, which has previously been inserted into the bulkhead 16. Thus, it is clear from the teachings of McGraw that a pressure-tight seal is not provided **directly** between the column 11 and the bulkhead 16, but that the Luer fitting 15 is positioned between the column 11 and the bulkhead 16. For at least these reasons, the Claim 28 is allowable over the teachings of McGraw.

Claim 28 is dependent on the independent Claim 27. As described above, the independent Claim 27 is allowable over the teachings of McGraw. Accordingly, the Claim 28 is both also allowable as being dependent on an allowable base claim.

Within the Office Action, Claims 27 and 28 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,240,680 to Zuckermann et al. (hereinafter “Zuckermann”). The applicants respectfully disagree.

Zuckermann teaches an actuation means for use in solid phase chemical synthesis involving arrays of modular reaction vessels. The apparatus taught by Zuckermann includes a plurality of reaction vessels arranged in a substantially linear array. [Zuckermann, Abstract] The reaction vessels of Zuckermann include modular valving means capable of being actuated to drain or close each of the reaction vessels in the array. [Zuckermann, Abstract] Specifically, Zuckermann teaches that a plug 28 is connected to a three-way valve 30 via tubing 32 to a source 36 of substantially inert gas. [Zuckermann, col. 3, lines 42-46, Figures 2 and 3] However, Zuckermann does not teach a body comprising an interior wall wherein the interior wall linearly tapers from the exterior support to the frit. Further, Zuckermann does not teach a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening. Instead, Zuckermann teaches a “cleavage vessel 14 is substantially cylindrical for most of its length.” [Zuckermann, Fig. 2 and col. 3, lines 23-24] Accordingly, Zuckermann does not teach the presently claimed invention.

The independent Claim 27 is directed to a vial comprising an exterior support and a bored interior having a consistent dimension to hold a frit for retaining material within the vial **directly** above the frit and maintain a consistent flow through the bored interior during a flushing procedure by **only** forming a pressure differential to expel material from the vial and a solid support retained within the vial above the frit after the flushing procedure, wherein the bored interior linearly tapers from the exterior support to the frit. As discussed above, Zuckermann does not teach wherein the interior wall linearly tapers from the exterior support to the frit. For at least these reasons, the independent Claim 27 is allowable over the teachings of Zuckermann.

Claim 28 is dependent on the independent Claim 27 and adds a further limitation specifying that the vial comprises an exterior dimension to fit **directly** within a receiving hole of a cartridge, thereby providing a pressure-tight seal directly between the vial and the cartridge. As discussed above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. For at least these reasons, the Claim 28 is allowable over the teachings of Zuckermann.

Claim 28 is dependent on the independent Claim 27. As described above, the independent Claim 27 is allowable over the teachings of Zuckermann. Accordingly, the Claims 28 is also allowable as being dependent on an allowable base claim.

Within the Office Action, Claims 27 and 28 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,609,826 to Cargill et al. (hereinafter “Cargill”). The applicants respectfully disagree.

Cargill teaches methods and apparatus for the generation of chemical libraries. Cargill teaches that reaction chambers 110 include a body portion 112 having a top opening 118 and a gas input port 122. [Cargill, col. 7, lines 45-56, Figure 2A] Cargill also teaches that a lower portion 114 of the reaction chamber 110 can receive a frit 124. [Cargill, col. 7, lines 65-67, Figure 2A] The reaction chamber 110 of Cargill also includes a funnel portion 130 and a generally cylindrical drain tube 132, which includes an annular sealing bead 134 to create a seal against the outside of an S-shaped trap tube 136. [Cargill, col. 8, lines 11-21, Figures 2A and 3] Cargill teaches that the trap tube 136 connects to a drain tube 138 such that when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. [Cargill, col. 8, lines 23-29, Figures 2A and 3] However, Cargill does not teach a body comprising an interior wall wherein the interior wall linearly tapers from the exterior support to the frit. Further, Cargill does not teach a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening. Instead, Cargill teaches a “reaction chamber 110 included a generally cylindrical body portion 112 of a first diameter, and a generally cylindrical lower body portion 114 that is coaxial with and of a smaller diameter than body portion 112.” [Cargill, Fig. 2A and col. 7, lines 45-48] Accordingly, Cargill does not teach the presently claimed invention.

The independent Claim 27 is directed to a vial comprising an exterior support and a bored interior having a consistent dimension to hold a frit for retaining material within the vial **directly** above the frit and maintain a consistent flow through the bored interior during a flushing procedure by **only** forming a pressure differential to expel material from the vial and a solid

support retained within the vial above the frit after the flushing procedure, wherein the bored interior linearly tapers from the exterior support to the frit. As discussed above, Cargill does not teach wherein the interior wall linearly tapers from the exterior support to the frit. For at least these reasons, the independent Claim 27 is allowable over the teachings of Cargill.

Claim 28 is dependent on the independent Claim 27 and adds a further limitation specifying that the vial comprises an exterior dimension to fit **directly** within a receiving hole of a cartridge, thereby providing a pressure-tight seal directly between the vial and the cartridge. As discussed above, Cargill does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. For at least these reasons, the Claim 28 is allowable over the teachings of Cargill.

Claim 28 is dependent on the independent Claim 27. As described above, the independent Claim 27 is allowable over the teachings of Cargill. Accordingly, the Claim 28 is also allowable as being dependent on an allowable base claim.

### **Rejections Under 35 U.S.C. § 103**

Within the Office Action, Claims 27-29, 35-38, 40, 42, 44, 52 and 61 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over McGraw. The applicants respectfully disagree.

#### **McGraw**

McGraw is directed to an apparatus and method for the automated synthesis of DNA segments utilizing multiple reaction columns. [McGraw, Abstract] Specifically, the columns of McGraw are all open at the inlet end to the atmosphere of a reaction chamber. [McGraw, Abstract] As recognized within the Office Action, McGraw does not teach a body comprising an interior wall wherein the interior wall linearly tapers from the exterior support to the frit. Further as recognized within the Office Action, McGraw does not teach a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening. Instead, McGraw teaches “a cylindrically shaped” reaction column 11 whose interior and outer walls only taper once below its “frit”, not continuously from the top opening to the bottom opening or from the exterior support to the frit. [McGraw, Fig. 6 and col. 5, lines 49-50] Accordingly, McGraw does not teach the presently claimed invention.

*In re Dailey* does not apply.

Within the Office Action, it is asserted that the difference between the prior art and the presently claimed invention is one of shape. Specifically, it is asserted that McGraw teaches a vial having a tapering surface with a different shape than the tapered surface of the presently claimed invention, but still provides the same function of retaining a solid support and frit on a narrowed portion inside the vial. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). The Office Action then continues by concluding that the different tapering shape was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant. The Applicant respectfully disagrees. Firstly, in contrast to the assertions in the Office Action, the small narrowed portion of McGraw below frit 9 does not provide the function of retaining a solid support and the frit. Instead, McGraw teaches that a support 100 is used for supporting the frits and any solid within the reaction column 11. [McGraw, col. 5, lines 52-55] Indeed, the only purpose of the tapering of McGraw is to provide a conically-shaped outlet end for insertion into a mating Luer fitting 15. [McGraw, col. 5, lines 51-52] As a result, it is clear that the tapered portion of McGraw is not only different than the presently claimed invention, but it also serves an entirely different function.

Secondly, *In re Dailey* did not relate to any change in shape, but only a simple change in magnitude in shape and is thus inapplicable here. Specifically, *In re Dailey* was directed to a nursing container wherein a lower portion was curved such that it comprised a portion of sphere that was smaller than a hemisphere, wherein the prior art included a curved lower portion that was a full hemisphere. *In re Dailey*, 357 F.2d 669, 670. Thus, the only difference was a matter of degree or magnitude of the curvature of the lower portion. Contrarily, in this case, the prior art does not merely lack a degree or magnitude of the interior wall tapering from the exterior support to the frit, McGraw lacks any tapering at all between the top portion and the frits 9, 9a. [McGraw, Fig. 6] Thus, *In re Dailey* does not apply to the presently claimed invention because the differences between the presently claimed invention and McGraw are not a mere matter of degree or magnitude. Accordingly, because 1) McGraw's end taper has a different function than the presently claimed invention and because 2) *In re Dailey* applies to mere changes in the magnitude of a feature in the prior art, not where the limitation is wholly absent from the prior art, the differences between McGraw and the presently claimed invention are not mere changes in shape and the teachings of *In re Dailey* are inapplicable.

There is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant.

Furthermore, even if *In re Dailey* does apply to the presently claimed invention in light of McGraw, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Firstly, the tapered configuration of the vial interior is significant because this tapered feature is what makes a consistent compression and seal with the frit possible, as well as the consistent flow of reagent solution. Specifically, it is stated within the Present Specification that “[a] precision bored interior 630 holds the frit 620 in place and provides a consistent compression and seal with the frit 620. As a result of the precision bored interior 630, there is a consistent flow of reagent solution through each vial during both the dispensing and purging processes.” [Present Specification, page 14, lines 3-6] In other words, it is clearly described within the Present Specification how important the tapered bored interior 630 is as it makes possible the compression, seal, and consistent flow that are all key to the effectiveness of the multi-well rotary synthesizer. In particular, one skilled in the art would recognize that the tapering bored interior 630 is what makes the compression/seal possible because the gradually narrowing interior walls act as a pincher that applies increasing pressure to the sides of the frit as the vial is evacuated. As a result, the frit sides are securely sealed to the interior wall forming the crucial air tight seal of the presently claimed invention (and the strength of this seal only increases with increased evacuation pressure).

Secondly, the tapered configuration is also key/significant to the presently claimed invention’s ability to produce a consistent flow of the reagent solution through each vial during both the dispensing and purging process. Specifically, one skilled in the art would understand that the air tight pressure provided by the tapered bored interior on all sides of the frit ensures that all of the reagent solution traverses through the entirety of the frit, and does not slip between the interior walls and the frit, thus only traversing a small bottom portion of the frit and disturbing the flow. Additionally, due to the steadily tapering of the walls, there is a correspondingly steady increase in solution pressure (as the vial narrows at the bottom). As a result, the tapered configuration permits the pressure applied to the reagent solution to not be drastically increased at the frit and thereby makes it easier to produce the desired consistent flow. Additionally, one skilled in the art would understand that the linearly tapered interior is significant because it allows the CPG 650 to be selectively suspended above the frit. Specifically, one skilled in the art would recognize that due to the tapered interior walls a user only needs to choose a CPG 650 that is slightly larger than the frit in order to secure the CPG 650

above the frit as the CPG 650 will be wedged in between the linearly narrowing walls before reaching the frit. Thus, the tapered configuration is key to both the desired consistent flow and the ability to selectively suspend the CPG 650 above the frit.

This is in contrast to the limited tapering in McGraw, which is too low to have any significant sealing effect on the frit because the supporting member 100 prevents any compression against the tapered portion from occurring. [See McGraw, Fig. 6] Furthermore, even if McGraw's tapered portion were allowed to be pressed against the frit, due to the extreme angle of the tapering, one skilled in the art would understand that the applied pressure would be primarily upward and not inward against the frit. As a result, there would be little pressure between the interior side walls and the frit and reagent would be able to bypass the frit and the support 100 along the side walls, possibly only traversing through the lower frit at the very edge where some upward pressure might be applied. Consequently, McGraw's configuration is unable to produce the same air tight seal with the frit or consistent flow of the reagent. Thus, the tapered portion of McGraw does not have the same significance of that of the presently claimed invention.

Furthermore, the tapered configuration of the vial is significant in that it allows substantially the entire body of the vial to fit within the cartridge. Specifically, it is stated within the Present Specification that "[t]he exterior of each vial 181 also has a precise dimension around the support 660. This support 660 fits within the receiving hole 185 within the cartridge 170 and provides a pressure tight seal around each vial within the cartridge 170." [Present Specification, page 14, lines 7-9] In other words, because the tapered configuration ensures that the vial gets increasingly narrower from top to bottom, it allows the support 660 to be specifically dimensioned to form an air-tight seal with the cartridge without any of the lower portions of the vial being too large to fit within the cartridge hole. Indeed, this tapered configuration is critical because if there were no taper (even if there was no expansion), substantially the entirety of the vial would need to be the precise dimension to form the seal, which one skilled in the art would understand to be simultaneously more costly and more difficult to insert into the cartridge hole. Moreover, due to the tapered configuration, substantially the entire body of the vial is able to be inserted in to the cartridge hole and thereby protected by the hole. This prevents unwanted movement or damage to the vial, wherein if the vial did not have its tapered configuration, its body would be exposed to potential harm. As a result, it is clear that the tapered configuration is significant to both the desired precision outer seal to the cartridge and the protection of the vial.

Contrarily, because McGraw only tapers at the very end of the chamber 11 in order to fit within the Luer fitting 15, the majority of the vial must remain exposed outside the protection of the bulkhead 16. [McGraw, Fig. 6] Thus, unlike the presently claimed invention, the tapering of McGraw is not able to perform the function of permitting the chamber 11 to be fully protected within the bulkhead 16 and thus more likely to be disturbed or damaged. Thus again, the tapered portion of McGraw does not have the same significance of that of the presently claimed invention. Accordingly, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant and the change of shape rejection should be withdrawn.

McGraw does not teach or make obvious the presently claimed invention.

McGraw teaches automated synthesis of oligonucleotides. McGraw teaches that columns 11 are formed into a carrier plate 8 or built to fit within Luer fittings. McGraw does not teach or make obvious a vial comprising a bored interior having a consistent dimension to hold a frit for retaining material within the **vial directly above the frit** and maintaining a consistent flow through the bored interior during a flushing procedure. McGraw also does not teach a molded polyethylene compressible vial. Further, McGraw does not teach a molded polyethylene compressible vial comprising an exterior compressible dimension to compressibly fit directly within a receiving hole. Moreover, McGraw does not teach or make obvious a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge.

Specifically, McGraw teaches that a column 11 is inserted into a Luer fitting 15, which has previously been inserted into a bulkhead 16. McGraw does not teach a **direct** fit between the column 11 and the bulkhead 16, nor does McGraw teach a support that has a precise dimension. As discussed thoroughly below, and evidenced by Figure 6 of McGraw, the support for the reaction column 11 is provided by the Luer fitting 15 which is fitted into the bulkhead. Additionally, as is well known in the art, Luer fittings have a male and female component that are joined to form a secure yet detachable leak-proof connection. As particularly demonstrated by Figure 6, the male end of the column 11 is inserted into the Luer fitting 15 which is inserted into the bulkhead 16. Therefore, clearly, McGraw cannot teach or make obvious a vial comprising a support with a precise dimension because it teaches using a Luer fitting for this purpose.

A close-up view of the reaction column 11 taught by McGraw is shown in Figure 2. [McGraw, col. 5, lines 49-52, Figure 2] McGraw teaches that a Luer fitting 15 is fitted into a



bulkhead 16. [McGraw, col. 5, lines 45-52, Figures 5 and 6] McGraw then teaches that the column 11 is inserted into the Luer fitting 15. [McGraw, col. 5, lines 51-52, Figures 5 and 6] McGraw does not teach that the column 11 is fitted directly into a bulkhead 16. Accordingly, McGraw does not teach that a *pressure-tight seal is provided **directly** between the column 11 and the bulkhead 16*. In contrast, McGraw teaches that the column is inserted into the Luer fitting 15, which has previously been inserted into the bulkhead 16. McGraw does not teach or make obvious a **direct** fit between the column 11 and the bulkhead 16.

Within a previous Office Action, it was stated that the McGraw reference shows the Luer fitting as a part of the bulkhead 16 since Figure 5 shows the Luer fitting extending through the bulkhead. The applicants respectfully disagree. McGraw does not teach that the column 11 is **directly** placed into the bulkhead 16. With respect to Figure 5, McGraw teaches

[t]he bulkhead 16 is sealed to the top of the solid frame 17' by means of the seal 95 such that the exit basin 17 is not connected to the atmosphere in the reaction chamber 10 except through the *Luer fittings 15 which receive the reaction columns 11*. [McGraw, col. 5, lines 44-48, Figure 5, emphasis added]

With respect to Figure 6, McGraw teaches “[t]he column 11 has a conically-shaped outlet end *for insertion into a mating Luer fitting 15*.” [McGraw, col. 5, lines 51-52, Figure 6, emphasis added.] The Luer fitting 15 and the bulkhead 16 are not one entity. As is well known in the art or can be discovered by quickly searching Google, Luer fittings 15 are a completely independent component, separate from the bulkhead 16. Although Figure 5 shows the Luer fitting 15 extending through the bulkhead 16, that does not make the two components one. The Luer fitting 15 of McGraw is inserted into the bulkhead 16 and then the column 11 is inserted into the Luer fitting 15. Therefore, McGraw teaches a column 11 being inserted into a Luer fitting 15 which is connected to a bulkhead 16. Thus, there is no **direct** contact between the column 11 and the bulkhead 16. Accordingly, McGraw does not teach or make obvious that a pressure-tight seal is provided **directly** between the column and a cartridge, since for a seal to be *directly* between the column 11 and cartridge 16 there could be nothing in between. In McGraw, the Luer fittings 15 are in between the column 11 and the bulkhead 16. **McGraw clearly teaches that a Luer fitting 15 is positioned between the column 11 and the bulkhead 16.**

In contrast to the teachings of McGraw, the vial of the presently claimed invention includes a support held within the vial **directly** above a frit. [Present Specification, page 3, lines 24-25] The interior of each vial is precision bored to ensure a tight consistent seal with the

corresponding frit. [Present Specification, page 3, lines 25-27] The vials are held within a cartridge. [Present Specification, page 3, lines 15-16] The exterior of each vial also has a precise dimension to consistently fit within the cartridge and provide a pressure tight seal around each vial *directly* within the cartridge. [Present Specification, page 3, line 27 - page 4, line 2] As discussed above, McGraw does not teach or make obvious that a pressure-tight seal is provided *directly* between the column and a cartridge. In contrast, McGraw teaches that the column is inserted into the Luer fitting 15, which has previously been inserted into the bulkhead 16. As further discussed above, McGraw does not teach or make obvious that a solid support is retained within the vial *directly* above a frit. In contrast, McGraw teaches that the support 100 is positioned between the frit 9 and the frit 9A.

Within the Response to Arguments section of a previous Office Action, it is stated that applicants have not claimed the cartridge and that no structural limitation is provided by the phrase “having an exterior dimension to fit directly within a receiving hole of a cartridge.” The applicants respectfully disagree. As an example, Claim 29 of the present application specifies a “vial comprising an exterior dimension to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge. . . .” It is further specified in Claim 29 that a consistent flow is maintained during flushing procedures by only forming a pressure differential to expel material. Without the exterior dimension forming a pressure-tight seal directly between the vial and the cartridge, the pressure differential could not be created for flushing procedures. Thus, this is more than just any exterior dimension which fits directly in a hole. Furthermore, as discussed in detail above, McGraw does not teach a pressure-tight seal that is provided *directly* between the column and a cartridge. In contrast to the pressure-tight seal and flushing procedures of the present application, McGraw teaches that “[p]referably a vacuum source is connected to the outlet end of the reaction columns to rapidly draw the chemicals from all of the columns simultaneously thus leaving the columns dry and ready to receive the next reagent.” [McGraw, col. 2, lines 17-22] The column 11 of McGraw requires the vacuum to flush the columns because of the absence of the pressure-tight seal. Because of the pressure-tight seal created by the exterior dimension of the vials of the present application, it is not necessary to connect a vacuum source to the outlet end of the vials, as taught by McGraw. This fundamental difference between the vial of the present application and the teachings of McGraw, serves to highlight the distinctions between the presently claimed invention and the teachings of McGraw.

It is further stated within the Response to Arguments section of a previous Office Action, that the pressure tight seal is beyond the scope of the claims. The Applicants respectfully disagree. As discussed in detail above, the pressure tight seal limitation gives meaning to the claims. Without the exterior dimension forming a pressure-tight seal directly between the vial and the cartridge, the pressure differential could not be created for flushing procedures and a vacuum, such as taught by McGraw, would be necessary. As described above, it is clearly specified within the claims that a pressure-tight seal is provided directly between the vial and the cartridge. It is further specified in the claims that a consistent flow is maintained during flushing procedures by **only** forming a pressure differential to expel material. As discussed in detail above, without the exterior dimension forming a pressure-tight seal directly between the vial and the cartridge, the pressure differential could not be created for flushing procedures and a vacuum, such as taught by McGraw, would be necessary. Accordingly, the pressure tight seal limitation in the claims cannot just be overlooked.

Furthermore, the pressure tight seal directly results from the precise dimension of the exterior around the support. Thus, the precise dimension of the exterior of the vial around the support is a structural limitation because without the precise dimension a pressure tight seal would not be able to be formed when the vial is placed in the cartridge. Within the Response to Arguments section of the Office Action, it is stated that, “[a]pplicant has claimed a “having an exterior dimension to fit directly within a receiving hole of a cartridge,” and “[t]herefore, any vial that has an exterior dimension that allows it to fit directly in a hole will meet this limitation.” The Applicants respectfully disagree. As stated above, Claim 29 of the present application specifies a “vial comprising an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge. . . .” Specifically, only a vial comprising an exterior support that is structurally capable of providing a pressure-tight seal between the vial and a cartridge will meet this limitation.

McGraw still does not meet this limitation, “having an exterior dimension to fit directly within a receiving hole of a cartridge.” As discussed above, McGraw teaches that a column 11 is inserted into a Luer fitting 15, which has previously been inserted into a bulkhead 16. Therefore, McGraw does not teach or make obvious a vial that to fit directly within a receiving hole of a cartridge because the column 11 must be inserted into the Luer fitting 15 before it is placed into the bulkhead 16. Thus, McGraw cannot teach the presently claimed invention.

The independent Claim 27 is directed to a vial comprising a bored interior having a consistent dimension to hold a frit for retaining material within the vial **directly** above the frit and

maintain a consistent flow through the bored interior during a flushing procedure by **only** forming a pressure differential to expel material from the vial and a solid support retained within the vial above the frit after the flushing procedure, wherein the bored interior linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, McGraw does not teach that a solid support is retained within the vial **directly** above a frit. In contrast, McGraw teaches that the support 100 is positioned between the frit 9 and the frit 9A. McGraw does not teach a flushing procedure by **only** forming a pressure differential to expel material from the vial. For at least these reasons, the independent Claim 27 is allowable over the teachings of McGraw.

Claim 28 is dependent on the independent Claim 27 and adds a further limitation specifying that the vial comprises an exterior dimension to fit **directly** within a receiving hole of a cartridge, thereby providing a pressure-tight seal **directly** between the vial and the cartridge. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, McGraw does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. In contrast, McGraw teaches that the column 11 is inserted into the Luer fitting 15, which has previously been inserted into the bulkhead 16. Thus, it is clear from the teachings of McGraw that a pressure-tight seal is not provided **directly** between the column 11 and the bulkhead 16, but that the Luer fitting 15 is positioned between the column 11 and the bulkhead 16. For at least these reasons, the Claim 28 is allowable over the teachings of McGraw.

Claims 28 and 40 are both dependent on the independent Claim 27. As described above, the independent Claim 27 is allowable over the teachings of McGraw. Accordingly, the Claims 28 and 40 are both also allowable as being dependent on an allowable base claim.

The independent Claim 29 is directed to a vial comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently

claimed invention is significant. Further, McGraw does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further described above, McGraw does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge. In contrast, McGraw teaches that the column is inserted into the Luer fitting 15, which has previously been inserted into the bulkhead 16. Thus, it is clear from the teachings of McGraw that a pressure-tight seal is not provided **directly** between the column 11 and the bulkhead 16, but that the Luer fitting 15 is positioned between the column 11 and the bulkhead 16. As further discussed above, McGraw does not teach that a solid support is retained within the vial above a frit. In contrast, McGraw teaches that the support 100 is positioned between the frit 9 and the frit 9A. McGraw also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. McGraw does not teach a flushing procedure by **only** forming a pressure differential to expel material from the vial. For at least these reasons, the independent Claim 29 is allowable over the teachings of McGraw.

Claim 42 is dependent on the independent Claim 29. As described above, the independent Claim 29 is allowable over the teachings of McGraw. Accordingly, the Claim 42 is also allowable as being dependent on an allowable base claim.

The independent Claim 35 is directed to a vial. The vial of Claim 35 comprises a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an outer wall to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the outer wall continuously tapers from the top opening to the bottom opening and a solid support retained within the vial above the frit after the flushing procedure. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, McGraw does not teach wherein the outer wall continuously tapers from the top opening to the bottom opening. As further described above, McGraw does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. In contrast, McGraw teaches that the column is inserted into the Luer fitting 15, which has previously been inserted into the bulkhead 16. Thus, it is clear from the teachings of

McGraw that a pressure-tight seal is not provided *directly* between the column 11 and the bulkhead 16, but that the Luer fitting 15 is positioned between the column 11 and the bulkhead 16. As further discussed above, McGraw does not teach that a solid support is retained within the vial above a frit. In contrast, McGraw teaches that the support 100 is positioned between the frit 9 and the frit 9A. McGraw also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. McGraw does not teach a flushing procedure by **only** forming a pressure differential to expel material from the vial. For at least these reasons, the independent Claim 35 is allowable over the teachings of McGraw.

Claim 44 is dependent on the independent Claim 35. As described above, the independent Claim 35 is allowable over the teachings of McGraw. Accordingly, the Claim 44 is also allowable as being dependent on an allowable base claim.

The independent Claim 36 is directed to a vial. The vial of Claim 36 comprises a frit, a solid support and a body comprising a bored interior having a consistent dimension to hold the frit for retaining the solid support above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, wherein the solid support and material formed on the solid support is retained above the frit, within the vial, during a flushing procedure, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure and an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and a cartridge when the vial is inserted into a receiving hole of the cartridge and an interior wall, wherein the internal wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, McGraw does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further described above, McGraw does not teach that a pressure-tight seal is provided *directly* between a vial and a cartridge. In contrast, McGraw teaches that the column is inserted into the Luer fitting 15, which has previously been inserted into the bulkhead 16. Thus, it is clear from the teachings of McGraw that a pressure-tight seal is not provided *directly* between the column 11 and the bulkhead 16, but that the Luer fitting 15 is positioned between the column 11 and the bulkhead 16. As further discussed above, McGraw does not teach that a solid support is retained within the vial above a frit. In contrast, McGraw teaches that the support 100 is positioned between the

frit 9 and the frit 9A. McGraw also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. McGraw does not teach a flushing procedure by **only** forming a pressure differential to expel material from the vial. For at least these reasons, the independent Claim 36 is allowable over the teachings of McGraw.

Claims 37 and 38 are both dependent on the independent Claim 36. As described above, the independent Claim 36 is allowable over the teachings of McGraw. Accordingly, the Claims 37 and 38 are both also allowable as being dependent on an allowable base claim.

The independent Claim 52 is directed to a plurality of vials. Each of the plurality of vials of Claim 52 comprise a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by **only** forming a pressure differential to expel material from the vial, wherein the consistent dimension is consistent for each of the plurality of vials, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior support to fit **directly** within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the exterior dimension is consistent for each of the plurality of vials such that any of the vials will consistently fit within the receiving hole of the cartridge, a solid support retained within the vial above the frit after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, McGraw does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further described above, McGraw does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. In contrast, McGraw teaches that the column is inserted into the Luer fitting 15, which has previously been inserted into the bulkhead 16. Thus, it is clear from the teachings of McGraw that a pressure-tight seal is not provided **directly** between the column 11 and the bulkhead 16, but that the Luer fitting 15 is positioned between the column 11 and the bulkhead 16. McGraw also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. McGraw does not teach a flushing procedure by **only** forming a pressure differential to expel material from the vial. For at least these reasons, the independent Claim 52 is allowable over the teachings of McGraw.

The independent Claim 61 is directed to a vial. The vial of Claim 61 comprises a top opening, a bottom opening, a precision bored interior that holds a frit, providing a consistent compression and seal with the frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process, a solid support within the vial that is retained above the frit after the purging process and a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge, an interior wall, wherein the interior wall linearly tapers from the support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, McGraw does not teach a body comprising an interior wall wherein the interior wall linearly tapers from the exterior support to the frit or a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening, thus neither can their combination. As further described above, McGraw does not teach a precision bored interior that holds a frit, providing a consistent compression and seal with the frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process, a solid support within the vial that is retained above the frit after the purging process. Further, McGraw does not teach a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge. Accordingly, the independent Claim 61 is allowable over the teachings of McGraw.

Within the Office Action, Claims 27-29, 35, 36, 38, 45-48, 50-54, 56, 57 and 61 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,240,680 to Zuckermann et al. (hereinafter “Zuckermann”). The applicants respectfully disagree.

#### Zuckermann

Zuckermann teaches an actuation means for use in solid phase chemical synthesis involving arrays of modular reaction vessels. The apparatus taught by Zuckermann includes a plurality of reaction vessels arranged in a substantially linear array. [Zuckermann, Abstract] The reaction vessels of Zuckermann include modular valving means capable of being actuated to drain or close each of the reaction vessels in the array. [Zuckermann, Abstract] Specifically, Zuckermann teaches that a plug 28 is connected to a three-way valve 30 via tubing 32 to a source 36 of substantially inert gas. [Zuckermann, col. 3, lines 42-46, Figures 2 and 3] However, as recognized within the Office Action, Zuckermann does not teach a body comprising an interior



wall wherein the interior wall linearly tapers from the exterior support to the frit. Further as recognized within the Office Action, Zuckermann does not teach a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening. Instead, Zuckermann teaches a “cleavage vessel 14 is substantially cylindrical for most of its length.” [Zuckermann, Fig. 2 and col. 3, lines 23-24] Accordingly, Zuckermann does not teach the presently claimed invention.

*In re Dailey* does not apply.

Within the Office Action, it is asserted that the difference between the prior art and the presently claimed invention is one of shape. Specifically, it is asserted that Zuckermann teaches a vial having a tapering surface with a different shape than the tapered surface of the presently claimed invention, but still provides the same function of retaining a solid support and frit on a narrowed portion inside the vial. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). It is then concluded within the Office Action that the different tapering shape was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant. The Applicant respectfully disagrees. *In re Dailey* did not relate to any change in shape, but only a simple change in magnitude in shape and is thus inapplicable here. Specifically, *In re Dailey* was directed to a nursing container wherein a lower portion was curved such that it comprised a portion of sphere that was smaller than a hemisphere, wherein the prior art included a curved lower portion that was a full hemisphere. *In re Dailey*, 357 F.2d 669, 670. Thus, the only difference was a matter of degree or magnitude of the curvature of the lower portion. Contrarily, in this case, the prior art does not merely lack a degree or magnitude of the interior wall tapering from the exterior support to the frit, Zuckermann lacks any tapering at all between the top portion and the frit 27. [Zuckermann, Fig. 2] Thus, *In re Dailey* does not apply to the presently claimed invention because the differences between the presently claimed invention and Zuckermann are not a mere matter of degree or magnitude. Accordingly, because *In re Dailey* applies to mere changes in the magnitude of a feature in the prior art, not where the limitation is wholly absent from the prior art, the differences between Zuckermann and the presently claimed invention are not mere changes in shape and the teachings of *In re Dailey* are inapplicable.

There is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant.

Furthermore, even if In re Dailey does apply to the presently claimed invention in light of Zuckermann, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Firstly, the tapered configuration of the vial interior is significant because this tapered feature is what makes a consistent compression and seal with the frit possible, as well as the consistent flow of reagent solution. Specifically, it is stated within the Present Specification that “[a] precision bored interior 630 holds the frit 620 in place and provides a consistent compression and seal with the frit 620. As a result of the precision bored interior 630, there is a consistent flow of reagent solution through each vial during both the dispensing and purging processes.” [Present Specification, page 14, lines 3-6] In other words, it is clearly described within the Present Specification how important the tapered bored interior 630 is as it makes possible the compression, seal, and consistent flow that are all key to the effectiveness of the multi-well rotary synthesizer. In particular, one skilled in the art would recognize that the tapering bored interior 630 is what makes the compression/seal possible because the gradually narrowing interior walls act as a pincher that applies increasing pressure to the sides of the frit as the vial is evacuated. As a result, the frit sides are securely sealed to the interior wall forming the crucial air tight seal of the presently claimed invention (and the strength of this seal only increases with increased evacuation pressure).

Secondly, the tapered configuration is also key/significant to the presently claimed invention’s ability to produce a consistent flow of the reagent solution through each vial during both the dispensing and purging process. Specifically, one skilled in the art would understand that the air tight pressure provided by the tapered bored interior on all sides of the frit ensures that all of the reagent solution traverses through the entirety of the frit, and does not slip between the interior walls and the frit, thus only traversing a small bottom portion of the frit and disturbing the flow. Additionally, due to the steadily tapering of the walls, there is a correspondingly steady increase in solution pressure (as the vial narrows at the bottom). As a result, the tapered configuration permits the pressure applied to the reagent solution to not be drastically increased at the frit and thereby makes it easier to produce the desired consistent flow. Additionally, one skilled in the art would understand that the linearly tapered interior is significant because it allows the CPG 650 to be selectively suspended above the frit. Specifically, one skilled in the art would recognize that due to the tapered interior walls a user only needs to choose a CPG 650 that is slightly larger than the frit in order to secure the CPG 650

above the frit as the CPG 650 will be wedged in between the linearly narrowing walls before reaching the frit. Thus, the tapered configuration is key to both the desired consistent flow and the ability to selectively suspend the CPG 650 above the frit.

This is in contrast to the limited tapering in Zuckermann, which is too short and severe in angle to have any significant sealing effect on the frit because the sides become essentially horizontal so quickly that any significant pinching force is lost. [See Zuckermann, Fig. 2] Indeed, due to the extreme angle of the “tapering” of Zuckermann, one skilled in the art would understand that the applied pressure would be primarily upward and not inward against the frit. As a result, there would be little pressure between the interior side walls and the frit and reagent would be able to bypass the frit along the side walls, possibly only traversing through the frit at the very edge where some upward pressure might be applied. Consequently, Zuckermann’s configuration is unable to produce the same air tight seal with the frit or consistent flow of the reagent. Thus, the tapered portion of Zuckermann does not have the same significance of that of the presently claimed invention.

Furthermore, the tapered configuration of the vial is significant in that it allows substantially the entire body of the vial to fit within the cartridge. Specifically, it is stated within the Present Specification that “[t]he exterior of each vial 181 also has a precise dimension around the support 660. This support 660 fits within the receiving hole 185 within the cartridge 170 and provides a pressure tight seal around each vial within the cartridge 170.” [Present Specification, page 14, lines 7-9] In other words, because the tapered configuration ensures that the vial gets increasingly narrower from top to bottom, it allows the support 660 to be specifically dimensioned to form an air-tight seal with the cartridge without any of the lower portions of the vial being too large to fit within the cartridge hole. Indeed, this tapered configuration is critical because if there were no taper (even if there was no expansion), substantially the entirety of the vial would need to be the precise dimension to form the seal, which one skilled in the art would understand to be simultaneously more costly and more difficult to insert into the cartridge hole. Moreover, due to the tapered configuration, substantially the entire body of the vial is able to be inserted in to the cartridge hole and thereby protected by the hole. This prevents unwanted movement or damage to the vial, wherein if the vial did not have its tapered configuration, its body would be exposed to potential harm. As a result, it is clear that the tapered configuration is significant to both the desired precision outer seal to the cartridge and the protection of the vial.

Contrarily, because Zuckermann only tapers at the very end of the vessel 14, in order to fit within a threaded plug 28, the majority of the vial must remain exposed outside the protection

of the cleavage vessel platform 12. [Zuckermann, Fig. 2] Thus, unlike the presently claimed invention, the tapering of Zuckermann is not able to perform the function of permitting the vessel 14 to be fully protected within the platform 12 and thus more likely to be disturbed or damaged. Thus again, the tapered portion of Zuckermann does not have the same significance of that of the presently claimed invention. Accordingly, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant and the change of shape rejection should be withdrawn.

Zuckermann does not teach or make obvious the presently claimed invention.

Zuckermann also does not teach that a pressure-tight seal is provided directly between the column and a cartridge. Further, Zuckermann does not teach or make obvious that a solid support is retained within the vial. Zuckermann also does not teach or make obvious that a solid support is retained within the vial directly above a frit. Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by only forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. Zuckermann also does not teach a molded polyethylene compressible vial. Further, Zuckermann does not teach a molded polyethylene compressible vial comprising an exterior compressible dimension to compressibly fit directly within a receiving hole. Moreover, Zuckermann does not teach or make obvious a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge.

As discussed above, it is further stated within the Response to Arguments section of a previous Office Action, that the pressure tight seal is beyond the scope of the claims. The Applicants respectfully disagree and do not understand how a limitation clearly included within the claims can just be unilaterally dismissed or overlooked. As discussed in detail above, the pressure tight seal limitation gives meaning to the claims. Without the exterior dimension forming a pressure-tight seal directly between the vial and the cartridge, the pressure differential could not be created for flushing procedures. As described above, it is clearly specified within the claims that a pressure-tight seal is provided directly between the vial and the cartridge. It is further specified in the claims that a consistent flow is maintained during flushing procedures by only forming a pressure differential to expel material. As discussed in detail above, without the exterior dimension forming a pressure-tight seal directly between the vial and the cartridge, the

pressure differential could not be created for flushing procedures. Accordingly, the pressure tight seal limitation in the claims has patentable weight.

In contrast to the teachings of Zuckermann, the vial of the presently claimed invention includes a support held within the vial directly above a frit. [Present Specification, page 3, lines 24-25] The interior of each vial is precision bored to ensure a tight consistent seal with the corresponding frit. [Present Specification, page 3, lines 25-27] The vials are held within a cartridge. [Present Specification, page 3, lines 15-16] The exterior of each vial also has a precise dimension to consistently fit within the cartridge and provide a pressure tight seal around each vial directly within the cartridge. [Present Specification, page 3, line 27 - page 4, line 2] As discussed above, Zuckermann does not teach or make obvious that a pressure-tight seal is provided directly between the column and a cartridge. Further, Zuckermann does not teach that a solid support is retained within the vial. Zuckermann also does not teach that a solid support is retained within the vial directly above a frit. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by only forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel.

The independent Claim 27 is directed to a vial comprising a bored interior having a consistent dimension to hold a frit for retaining material within the vial **directly** above the frit and maintain a consistent flow through the bored interior during a flushing procedure by **only** forming a pressure differential to expel material from the vial and *a solid support* retained within the vial above the frit after the flushing procedure, wherein the bored interior linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach that a solid support is retained within the vial **directly** above a frit. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. For at least these reasons, the independent Claim 27 is allowable over the teachings of Zuckermann.

Claim 28 is dependent on the independent Claim 27 and adds a further limitation specifying that the vial comprises an exterior dimension to fit **directly** within a receiving hole of

a cartridge, thereby providing a pressure-tight seal directly between the vial and the cartridge. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. For at least these reasons, the Claim 28 is allowable over the teachings of Zuckermann.

Claims 28 and 40 are both dependent on the independent Claim 27. As described above, the independent Claim 27 is allowable over the teachings of Zuckermann. Accordingly, the Claims 28 and 40 are both also allowable as being dependent on an allowable base claim.

The independent Claim 29 is directed to a vial comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge. As further discussed above, Zuckermann does not teach that a solid support is retained within the vial above a frit. Zuckermann also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. For at least these reasons, the independent Claim 29 is allowable over the teachings of Zuckermann.

Claims 30 and 42 are both dependent on the independent Claim 29. As described above, the independent Claim 29 is allowable over the teachings of Zuckermann. Accordingly, the Claims 30 and 42 are both also allowable as being dependent on an allowable base claim.

The independent Claim 35 is directed to a vial. The vial of Claim 35 comprises a bored interior having a consistent dimension to hold a frit for retaining material above the frit and

maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an outer wall to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the outer wall continuously tapers from the top opening to the bottom opening and a solid support retained within the vial above the frit after the flushing procedure. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the outer wall continuously tapers from the top opening to the bottom opening. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. As further discussed above, Zuckermann does not teach that a solid support is retained within the vial above a frit. Zuckermann also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. For at least these reasons, the independent Claim 35 is allowable over the teachings of Zuckermann.

Claim 44 is dependent on the independent Claim 35. As described above, the independent Claim 35 is allowable over the teachings of Zuckermann. Accordingly, the Claim 44 is also allowable as being dependent on an allowable base claim.

The independent Claim 36 is directed to a vial. The vial of Claim 36 comprises a frit, a solid support and a body comprising a bored interior having a consistent dimension to hold the frit for retaining the solid support above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, wherein the solid support and material formed on the solid support is retained above the frit, within the vial, during a flushing procedure, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure and an exterior support to fit directly within a receiving hole of a

cartridge to form a pressure-tight seal directly between the vial and a cartridge when the vial is inserted into a receiving hole of the cartridge and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. As further discussed above, Zuckermann does not teach that a solid support is retained within the vial above a frit. Zuckermann also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. For at least these reasons, the independent Claim 36 is allowable over the teachings of Zuckermann.

Claims 37 and 38 are both dependent on the independent Claim 36. As described above, the independent Claim 36 is allowable over the teachings of Zuckermann. Accordingly, the Claims 37 and 38 are both also allowable as being dependent on an allowable base claim.

The independent Claim 45 is directed to a vial including an interior wall and a bored interior having a consistent dimension to hold a frit, the vial consisting essentially of a single frit for retaining material within the vial directly above the single frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the interior wall linearly tapers from an exterior support to the frit. As further discussed above, Zuckermann does not teach that a solid support is retained within the vial **directly** above a single frit. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract



material from the reaction vessel. For at least these reasons, the independent Claim 45 is allowable over the teachings of Zuckermann.

The independent Claim 46 is directed to a vial including an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial directly above a frit, the vial consisting essentially of a single frit, after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge. As further discussed above, Zuckermann does not teach that a solid support is retained within the vial above a single frit. Zuckermann also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. For at least these reasons, the independent Claim 46 is allowable over the teachings of Zuckermann.

The independent Claim 47 is directed to a vial. The vial of Claim 47 comprises an interior wall, a bored interior having a consistent dimension, a material for growing a polymer chain and a frit for retaining the material within the vial **directly** above the frit and maintain a consistent flow through the bored interior during a flushing procedure by **only** forming a pressure differential to expel material from the vial and *a solid support* retained within the vial above the frit after the flushing procedure, the vial consisting essentially of a single frit, wherein the interior wall linearly tapers from an exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the interior wall linearly tapers from an exterior support to the frit. As further discussed above, Zuckermann does not teach that a solid support is retained within the vial

**directly** above a frit. Zuckermann also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. For at least these reasons, the independent Claim 47 is allowable over the teachings of Zuckermann.

The independent Claim 48 is directed to a vial. The vial of Claim 48 comprises an interior wall and a bored interior having a consistent dimension to hold a frit, the vial consisting essentially of a single frit for retaining material within the vial directly above the single frit without any additional frits and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the interior wall linearly tapers from an exterior support to the frit. As further described above, Zuckermann does not teach that a solid support is retained within the vial above a single frit. Zuckermann also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. For at least these reasons, the independent Claim 48 is allowable over the teachings of Zuckermann.

The independent Claim 50 is directed to a plurality of vials each comprising an interior wall and a bored interior having a consistent dimension to hold a frit, wherein the consistent dimension is consistent for each of the plurality of vials, each of the vials consisting essentially of a single frit for retaining material within the vial directly above the single frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply,

there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the interior wall linearly tapers from an exterior support to the frit. As further described above, Zuckermann does not teach that a solid support is retained within the vial above a single frit. Zuckermann also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. For at least these reasons, the independent Claim 50 is allowable over the teachings of Zuckermann.

The independent claim 51 is directed to a plurality of vials each comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, wherein the exterior dimension is consistent for each of the plurality of vials such that any of the vials will consistently fit within the receiving hole of the cartridge, each of the plurality of vials further comprising a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial directly above a frit, the vial consisting essentially of a single frit, after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further discussed above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge. As also discussed above, Zuckermann does not teach that a solid support is retained within the vial above a single frit. Zuckermann also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to

extract material from the reaction vessel. For at least these reasons, the independent Claim 51 is allowable over the teachings of Zuckermann.

The independent Claim 52 is directed to a plurality of vials. Each of the plurality of vials of Claim 52 comprise a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by **only** forming a pressure differential to expel material from the vial, wherein the consistent dimension is consistent for each of the plurality of vials, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior support to fit **directly** within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the exterior dimension is consistent for each of the plurality of vials such that any of the vials will consistently fit within the receiving hole of the cartridge, a solid support retained within the vial above the frit after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge. As also discussed above, Zuckermann does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. For at least these reasons, the independent Claim 52 is allowable over the teachings of Zuckermann.

The independent Claim 53 is directed to a plastic vial comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers

from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further discussed above, Zuckermann does not teach that a solid support is retained within the vial above a frit. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. Zuckermann also does not teach a plastic vial comprising an exterior dimension to fit directly within a receiving hole. For at least these reasons, the independent Claim 53 is allowable over the teachings of Zuckermann.

Claim 54 is dependent on the independent Claim 53. As described above, the independent Claim 53 is allowable over the teachings of Zuckermann. Accordingly, the Claim 54 is also allowable as being dependent on an allowable base claim.

The independent Claim 56 is directed to a plastic vial comprising a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, a solid support retained within the vial above the frit after the flushing procedure and an interior wall, wherein the interior wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further described above, Zuckermann does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. As further discussed above, Zuckermann does not teach that a solid support is retained within the vial above a frit. Zuckermann also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Zuckermann does not teach maintaining a consistent flow through the bored

interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Zuckermann teaches that the three-way valve 30 is used to extract material from the reaction vessel. Zuckermann also does not teach a plastic vial comprising an exterior dimension to fit directly within a receiving hole. For at least these reasons, the independent Claim 56 is allowable over the teachings of Zuckermann.

Claim 57 is dependent on the independent Claim 56. As described above, the independent Claim 56 is allowable over the teachings of Zuckermann. Accordingly, the Claim 57 is also allowable as being dependent on an allowable base claim.

The independent Claim 61 is directed to a vial. The vial of Claim 61 comprises a top opening, a bottom opening, a precision bored interior that holds a frit, providing a consistent compression and seal with the frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process, a solid support within the vial that is retained above the frit after the purging process and a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge, an interior wall, wherein the interior wall linearly tapers from the support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Zuckermann does not teach a body comprising an interior wall wherein the interior wall linearly tapers from the exterior support to the frit or a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening, thus neither can their combination. As further described above, Zuckermann does not teach a precision bored interior that holds a frit, providing a consistent compression and seal with the frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process, a solid support within the vial that is retained above the frit after the purging process. Further, Zuckermann does not teach a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge. Accordingly, the independent Claim 61 is allowable over the teachings of Zuckermann.

Within the Office Action, Claims 27-30, 35, 36, 38, 45-48 and 50 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,609,826 to Cargill et al. (hereinafter “Cargill”). The applicants respectfully disagree.

Cargill

Cargill teaches methods and apparatus for the generation of chemical libraries. Cargill teaches that reaction chambers 110 include a body portion 112 having a top opening 118 and a gas input port 122. [Cargill, col. 7, lines 45-56, Figure 2A] Cargill also teaches that a lower portion 114 of the reaction chamber 110 can receive a frit 124. [Cargill, col. 7, lines 65-67, Figure 2A] The reaction chamber 110 of Cargill also includes a funnel portion 130 and a generally cylindrical drain tube 132, which includes an annular sealing bead 134 to create a seal against the outside of an S-shaped trap tube 136. [Cargill, col. 8, lines 11-21, Figures 2A and 3] Cargill teaches that the trap tube 136 connects to a drain tube 138 such that when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. [Cargill, col. 8, lines 23-29, Figures 2A and 3] However, as recognized within the Office Action, Cargill does not teach a body comprising an interior wall wherein the interior wall linearly tapers from the exterior support to the frit. Further recognized within the Office Action, Cargill does not teach a vial comprising an outer wall wherein the outer wall continuously tapers from the top opening to the bottom opening. Instead, Cargill teaches a “reaction chamber 110 included a generally cylindrical body portion 112 of a first diameter, and a generally cylindrical lower body portion 114 that is coaxial with and of a smaller diameter than body portion 112.” [Cargill, Fig. 2A and col. 7, lines 45-48] Accordingly, Cargill does not teach the presently claimed invention.

*In re Dailey* does not apply.

Within the Office Action, it is asserted that the difference between the prior art and the presently claimed invention is one of shape. Specifically, it is asserted that Cargill teaches a vial having a tapering surface with a different shape than the tapered surface of the presently claimed invention, but still provides the same function of retaining a solid support and frit on a narrowed portion inside the vial. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). The Office Action then continues by concluding that the different tapering shape was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant. The Applicant respectfully disagrees. Firstly, in contrast to the assertions in the Office Action, the small narrowed portion of Cargill below frit 124 does not provide the function of retaining a solid support and the frit. Instead, Cargill teaches that an annular bead 126 is used to retain/support the frit 124. [Cargill, col. 8, lines 8-10] Indeed, the only purpose of the funnel shaped portion 130 of Cargill is to allow full area exposure, not to support, the underside of the frit 124, to enhance the draining of liquids from the reaction chamber 110. [Cargill, col. 8, lines 11-15] As a result, it

is clear that the tapered portion of Cargill is not only different than the presently claimed invention, but it also serves an entirely different function.

Secondly, *In re Dailey* did not relate to any change in shape, but only a simple change in magnitude in shape and is thus inapplicable here. Specifically, *In re Dailey* was directed to a nursing container wherein a lower portion was curved such that it comprised a portion of sphere that was smaller than a hemisphere, wherein the prior art included a curved lower portion that was a full hemisphere. *In re Dailey*, 357 F.2d 669, 670. Thus, the only difference was a matter of degree or magnitude of the curvature of the lower portion. Contrarily, in this case, the prior art does not merely lack a degree or magnitude of the interior wall tapering from the exterior support to the frit, Cargill lacks any significant tapering at all between the top portion and the frit. [Cargill, Fig. 2A] Thus, *In re Dailey* does not apply to the presently claimed invention because the differences between the presently claimed invention and Cargill are not a mere matter of similar degree or magnitude. Accordingly, because 1) Cargill's end taper has a different function than the presently claimed invention and because 2) *In re Dailey* applies to mere changes in the magnitude of a feature in the prior art, not where the limitation is wholly absent from the prior art, the differences between Cargill and the presently claimed invention are not mere changes in shape and the teachings of *In re Dailey* are inapplicable.

There is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant.

Furthermore, even if *In re Dailey* does apply to the presently claimed invention in light of Cargill, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Firstly, the tapered configuration of the vial interior is significant because this tapered feature is what makes a consistent compression and seal with the frit possible, as well as the consistent flow of reagent solution. Specifically, it is stated within the Present Specification that “[a] precision bored interior 630 holds the frit 620 in place and provides a consistent compression and seal with the frit 620. As a result of the precision bored interior 630, there is a consistent flow of reagent solution through each vial during both the dispensing and purging processes.” [Present Specification, page 14, lines 3-6] In other words, it is clearly described within the Present Specification how important the tapered bored interior 630 is as it makes possible the compression, seal, and consistent flow that are all key to the effectiveness of the multi-well rotary synthesizer. In particular, one skilled in the art would recognize that the tapering bored interior 630 is what makes the compression/seal possible



because the gradually narrowing interior walls act as a pincher that applies increasing pressure to the sides of the frit as the vial is evacuated. As a result, the frit sides are securely sealed to the interior wall forming the crucial air tight seal of the presently claimed invention (and the strength of this seal only increases with increased evacuation pressure).

Secondly, the tapered configuration is also key/significant to the presently claimed invention's ability to produce a consistent flow of the reagent solution through each vial during both the dispensing and purging process. Specifically, one skilled in the art would understand that the air tight pressure provided by the tapered bored interior on all sides of the frit ensures that all of the reagent solution traverses through the entirety of the frit, and does not slip between the interior walls and the frit, thus only traversing a small bottom portion of the frit and disturbing the flow. Additionally, due to the steadily tapering of the walls, there is a correspondingly steady increase in solution pressure (as the vial narrows at the bottom). As a result, the tapered configuration permits the pressure applied to the reagent solution to not be drastically increased at the frit and thereby makes it easier to produce the desired consistent flow. Additionally, one skilled in the art would understand that the linearly tapered interior is significant because it allows the CPG 650 to be selectively suspended above the frit. Specifically, one skilled in the art would recognize that due to the tapered interior walls a user only needs to choose a CPG 650 that is slightly larger than the frit in order to secure the CPG 650 above the frit as the CPG 650 will be wedged in between the linearly narrowing walls before reaching the frit. Thus, the tapered configuration is key to both the desired consistent flow and the ability to selectively suspend the CPG 650 above the frit.

This is in contrast to the limited tapering in Cargill, which is too low to have any significant sealing effect on the frit because the annular bead 126 prevents any compression against the tapered portion 130 from occurring. [See Cargill, Fig. 2A] Furthermore, even if Cargill's tapered portion 130 was allowed to be pressed against the frit, due to the extreme angle of the tapering, one skilled in the art would understand that the applied pressure would be primarily upward and not inward against the frit. As a result, there would be little pressure between the interior side walls and the frit and reagent would be able to bypass the frit and the support 100 along the side walls, possibly only traversing through the frit at the very edge where some upward pressure might be applied. Consequently, Cargill's configuration is unable to produce the same air tight seal with the frit or consistent flow of the reagent. Thus, the tapered portion of Cargill does not have the same significance of that of the presently claimed invention.

Furthermore, the tapered configuration of the vial is significant in that it allows substantially the entire body of the vial to fit within the cartridge. Specifically, it is stated within the Present Specification that “[t]he exterior of each vial 181 also has a precise dimension around the support 660. This support 660 fits within the receiving hole 185 within the cartridge 170 and provides a pressure tight seal around each vial within the cartridge 170.” [Present Specification, page 14, lines 7-9] In other words, because the tapered configuration ensures that the vial gets increasingly narrower from top to bottom, it allows the support 660 to be specifically dimensioned to form an air-tight seal with the cartridge without any of the lower portions of the vial being too large to fit within the cartridge hole. Indeed, this tapered configuration is critical because if there were no taper (even if there was no expansion), substantially the entirety of the vial would need to be the precise dimension to form the seal, which one skilled in the art would understand to be simultaneously more costly and more difficult to insert into the cartridge hole. Moreover, due to the tapered configuration, substantially the entire body of the vial is able to be inserted in to the cartridge hole and thereby protected by the hole. This prevents unwanted movement or damage to the vial, wherein if the vial did not have its tapered configuration, its body would be exposed to potential harm. As a result, it is clear that the tapered configuration is significant to both the desired precision outer seal to the cartridge and the protection of the vial. Accordingly, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant and the change of shape rejection should be withdrawn.

Cargill does not teach or make obvious the presently claimed invention.

Cargill also does not teach that a pressure-tight seal is provided **directly** between a column and a cartridge. Cargill also does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Cargill teaches that the annular sealing bead 134 creates a seal and when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. Cargill also does not teach a molded polyethylene compressible vial. Further, Cargill does not teach a molded polyethylene compressible vial comprising an exterior compressible dimension to compressibly fit directly within a receiving hole. Additionally, Cargill does not teach a support that has a precise dimension that provides a pressure tight seal around the vial when the vial is placed in a cartridge. Moreover, Cargill does not teach or make obvious a precision bored interior that holds a frit, providing a consistent compression and seal with the

frit and provides a consistent flow of a reagent solution through the vial during a dispensing and a purging process.

Specifically, Cargill teaches that a frit 124 is press fit into the lower portion 114 of the reaction chamber 110. [Cargill, col. 8, line 5] The lower portion 114 also includes an annular bead 126 to retain the frit 124 when it is pressed into place. [Cargill, col. 8, lines 8-10] Thus, Cargill does not teach a precision bored interior that holds a frit, providing a consistent compression and seal with the frit. Particularly, Cargill cannot teach that the interior of the reaction chamber 110 provides a consistent compression and seal with the frit 124 because any consistent compression and seal with the frit is disrupted by the annular bead 126 which retains the frit 124 when it is pressed into place. Thus, Cargill does not teach or make obvious the presently claimed invention.

Additionally, as described above, it is further stated within the Response to Arguments section of the Office Action, that the pressure tight seal is beyond the scope of the claims. The Applicants respectfully disagree. Without the exterior dimension forming a pressure-tight seal directly between the vial and the cartridge, the pressure differential could not be created for flushing procedures. As described above, it is clearly specified within the claims that a pressure-tight seal is provided directly between the vial and the cartridge. It is further specified in the claims that a consistent flow is maintained during flushing procedures by **only** forming a pressure differential to expel material. As discussed in detail above, without the exterior dimension forming a pressure-tight seal directly between the vial and the cartridge, the pressure differential could not be created for flushing procedures. Accordingly, the pressure tight seal limitation in the claims cannot just be overlooked.

In contrast to the teachings of Cargill, the vial of the presently claimed invention includes a support held within the vial directly above a frit. [Present Specification, page 3, lines 24-25] The interior of each vial is precision bored to ensure a tight consistent seal with the corresponding frit. [Present Specification, page 3, lines 25-27] The vials are held within a cartridge. [Present Specification, page 3, lines 15-16] The exterior of each vial also has a precise dimension to consistently fit within the cartridge and provide a pressure tight seal around each vial **directly** within the cartridge. [Present Specification, page 3, line 27 - page 4, line 2] As discussed above, Cargill does not teach or make obvious that a pressure-tight seal is provided directly between the column and a cartridge. As further discussed above, Cargill does not teach or make obvious maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above,

Cargill teaches that the annular sealing bead 134 creates a seal and when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138.

The independent Claim 27 is directed to a vial comprising a bored interior having a consistent dimension to hold a frit for retaining material within the vial directly above the frit and maintain a consistent flow through the bored interior during a flushing procedure by **only** forming a pressure differential to expel material from the vial and a solid support retained within the vial above the frit after the flushing procedure, wherein the bored interior linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Cargill does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Cargill teaches that the annular sealing bead 134 creates a seal and when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. For at least these reasons, the independent Claim 27 is allowable over the teachings of Cargill.

Claim 28 is dependent on the independent Claim 27 and adds a further limitation specifying that the vial comprises an exterior dimension to fit **directly** within a receiving hole of a cartridge, thereby providing a pressure-tight seal directly between the vial and the cartridge. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Cargill does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. For at least these reasons, the Claim 28 is allowable over the teachings of Cargill.

Claims 28 and 40 are both dependent on the independent Claim 27. As described above, the independent Claim 27 is allowable over the teachings of Cargill. Accordingly, the Claims 28 and 40 are both also allowable as being dependent on an allowable base claim.

The independent Claim 29 is directed to a vial comprising an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above a frit after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply,

there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Cargill does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge. As further discussed above, Cargill does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Cargill does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Cargill teaches that the annular sealing bead 134 creates a seal and when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. For at least these reasons, the independent Claim 29 is allowable over the teachings of Cargill.

Claims 30 and 42 are both dependent on the independent Claim 29. As described above, the independent Claim 29 is allowable over the teachings of Cargill. Accordingly, the Claims 30 and 42 are both also allowable as being dependent on an allowable base claim.

The independent Claim 35 is directed to a vial. The vial of Claim 35 comprises a bored interior having a consistent dimension to hold a frit for retaining material above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure, an outer wall to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and the cartridge when the vial is inserted into a receiving hole of the cartridge, wherein the outer wall continuously tapers from the top opening to the bottom opening and a solid support retained within the vial above the frit after the flushing procedure. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Cargill does not teach wherein the outer wall continuously tapers from the top opening to the bottom opening. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. Cargill also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Cargill does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above,

Cargill teaches that the annular sealing bead 134 creates a seal and when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. For at least these reasons, the independent Claim 35 is allowable over the teachings of Cargill.

Claim 44 is dependent on the independent Claim 35. As described above, the independent Claim 35 is allowable over the teachings of Cargill. Accordingly, the Claim 44 is also allowable as being dependent on an allowable base claim.

The independent Claim 36 is directed to a vial. The vial of Claim 36 comprises a frit, a solid support and a body comprises a bored interior having a consistent dimension to hold the frit for retaining the solid support above the frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial, wherein the solid support and material formed on the solid support is retained above the frit, within the vial, during a flushing procedure, a top opening through which material is dispensed into the bored interior, a bottom opening of a diameter to retain material within the bored interior when no pressure differential is applied and through which material is flushed during the flushing procedure and an exterior support to fit directly within a receiving hole of a cartridge to form a pressure-tight seal directly between the vial and a cartridge when the vial is inserted into a receiving hole of the cartridge and an internal wall, wherein the internal wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Cargill does not teach wherein the internal wall linearly tapers from the exterior support to the frit. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly** between a vial and a cartridge. Cargill also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Cargill does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Cargill teaches that the annular sealing bead 134 creates a seal and when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. For at least these reasons, the independent Claim 36 is allowable over the teachings of Cargill.

Claims 37 and 38 are both dependent on the independent Claim 36. As described above, the independent Claim 36 is allowable over the teachings of Cargill. Accordingly, the Claims 37 and 38 are both also allowable as being dependent on an allowable base claim.

The independent Claim 45 is directed to a vial including an interior wall and a bored interior having a consistent dimension to hold a frit, the vial consisting essentially of a single frit for retaining material within the vial directly above the single frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Cargill does not teach wherein the interior wall linearly tapers from an exterior support to the frit. As further described above, Cargill does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Cargill teaches that the annular sealing bead 134 creates a seal and when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. For at least these reasons, the independent Claim 45 is allowable over the teachings of Cargill.

The independent Claim 46 is directed to a vial including an interior wall and an exterior support to fit directly within a receiving hole of a cartridge thereby providing a pressure-tight seal directly between the vial and the cartridge, a bored interior having a consistent dimension to maintain a consistent flow through the bored interior during flushing procedures by only forming a pressure differential to expel material from the vial and a solid support retained within the vial directly above a frit, the vial consisting essentially of a single frit, after flushing procedures, wherein the interior wall linearly tapers from the exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Cargill does not teach wherein the interior wall linearly tapers from the exterior support to the frit. As further described above, Cargill does not teach that a pressure-tight seal is provided **directly** between the column and a cartridge. Cargill also does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Cargill does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Cargill teaches that the annular sealing bead 134 creates a seal and when the reaction chamber 110 is pressurized, liquid flows through the

trap tube 136 and out the drain tube 138. For at least these reasons, the independent Claim 46 is allowable over the teachings of Cargill.

The independent Claim 47 is directed to a vial. The vial of Claim 47 comprises an interior wall, a bored interior having a consistent dimension, a material for growing a polymer chain and a frit for retaining the material within the vial **directly** above the frit and maintain a consistent flow through the bored interior during a flushing procedure by **only** forming a pressure differential to expel material from the vial and *a solid support* retained within the vial above the frit after the flushing procedure, the vial consisting essentially of a single frit, wherein the interior wall linearly tapers from an exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Cargill does not teach wherein the interior wall linearly tapers from an exterior support to the frit. As further discussed above, Cargill does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Cargill does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Cargill teaches that the annular sealing bead 134 creates a seal and when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. For at least these reasons, the independent Claim 47 is allowable over the teachings of Cargill.

The independent Claim 48 is directed to a vial. The vial of Claim 48 comprises an interior wall and a bored interior having a consistent dimension to hold a frit, the vial consisting essentially of a single frit for retaining material within the vial directly above the single frit without any additional frits and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Cargill does not teach wherein the interior wall linearly tapers from an exterior support to the frit. As further described above, Cargill does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Cargill does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by only forming a pressure differential to expel material.



As described above, Cargill teaches that the annular sealing bead 134 creates a seal and when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. For at least these reasons, the independent Claim 48 is allowable over the teachings of Cargill.

The independent Claim 50 is directed to a plurality of vials each comprising an interior wall and a bored interior having a consistent dimension to hold a frit, wherein the consistent dimension is consistent for each of the plurality of vials, each of the vials consisting essentially of a single frit for retaining material within the vial directly above the single frit and maintain a consistent flow through the bored interior during a flushing procedure by only forming a pressure differential to expel material from the vial and a solid support retained within the vial above the single frit after the flushing procedure, wherein the interior wall linearly tapers from an exterior support to the frit. As discussed above, *In re Dailey* does not apply, and even if it does apply, there is persuasive evidence that the particular configuration of the tapering of the presently claimed invention is significant. Further, Cargill does not teach wherein the interior wall linearly tapers from an exterior support to the frit. As further described above, Cargill does not teach that a vial includes a bored interior having a consistent dimension to maintain a consistent flow through the bored interior. As further discussed above, Cargill does not teach maintaining a consistent flow through the bored interior of a vial during a flushing procedure by **only** forming a pressure differential to expel material. As described above, Cargill teaches that the annular sealing bead 134 creates a seal and when the reaction chamber 110 is pressurized, liquid flows through the trap tube 136 and out the drain tube 138. For at least these reasons, the independent Claim 50 is allowable over the teachings of Cargill.

Applicants respectfully submit that the claims, as amended, are now in a condition for allowance, and allowance at an early date would be appreciated. Should the Examiner have any questions or comments, they are encouraged to call the undersigned at (408) 530-9700 to discuss the same so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,  
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